Intro to Maths 2 : Worksheet 3

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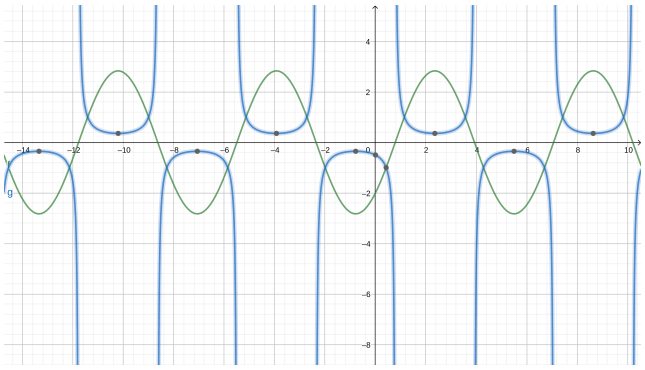
1. Functions that have a inverse :
   $f(x) = 2x + 3 \qquad f : R \to R$
   $f(x) = sin(x) \qquad f : [0, \pi] \to [-1, 1]$

   Functions that do not have a inverse :
   $f(x) = 1/x \qquad f : R \to R$
   $f(x) = x^2 \qquad f : R \to R$

   Inverse of a function is unique

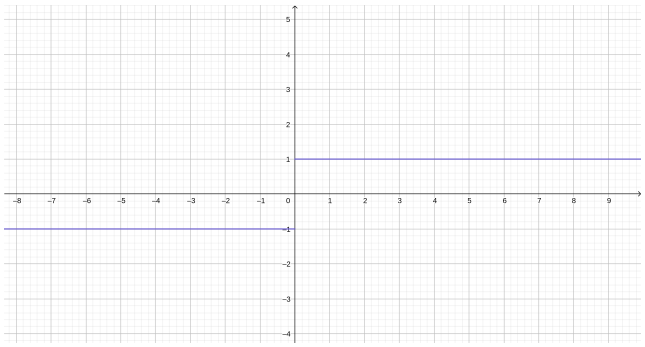
   Graph :
   $f(x) = 2(six(x) - cos(x))$ in green
   $f^(-1)(x)$ in blue



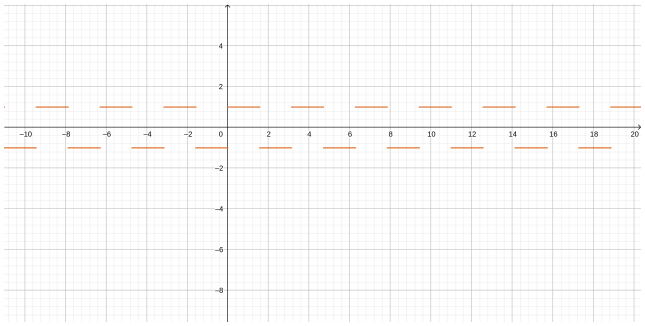
2. Domain of $\chi_A : R$
   Codomian of $\chi_A : R$

   If $x \in A \cap B \qquad (\chi_A + \chi_B)(x) = \chi_A(x) + \chi_B(x) = 2$
   So, $\chi_{A \cap B} = \chi_A + \chi_B - \chi_{A \cap B}$

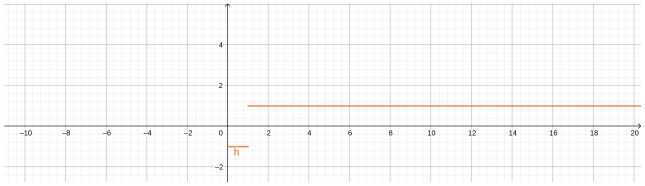
3. Graph of $x/|x|$



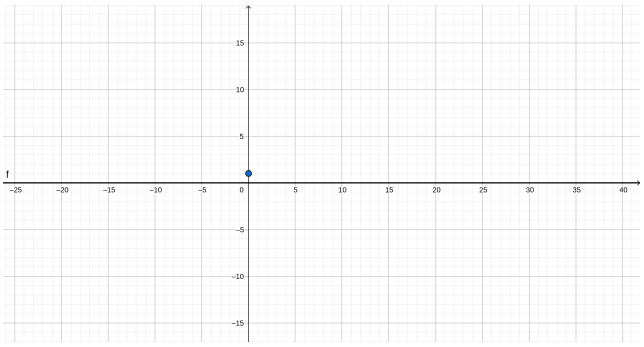
   Graph of $tan(x)/|tan(x)|$



   Graph of $log(x)/|log(x)|$



4. Graph of Dirac Delta function



5. Binary Relations :

   $[(1,1)(1,2)(2,1)(2,2)(2,a)(a,2)(a,a)(1,a)(a,1)]$ is a equivalence relation

   $[(1,1)(1,2)(2,1)(2,2)(2,a)(a,2)(a,a)(1,a)]$ is Reflexive and Transitive but not symmetric because there is no (a,1)

   $[(1,1)(1,2)(2,1)(2,2)(2,a)(a,2)(1,a)(a,1)]$ is Symmetric and Transitive but not Reflexive because there is no (a,a)